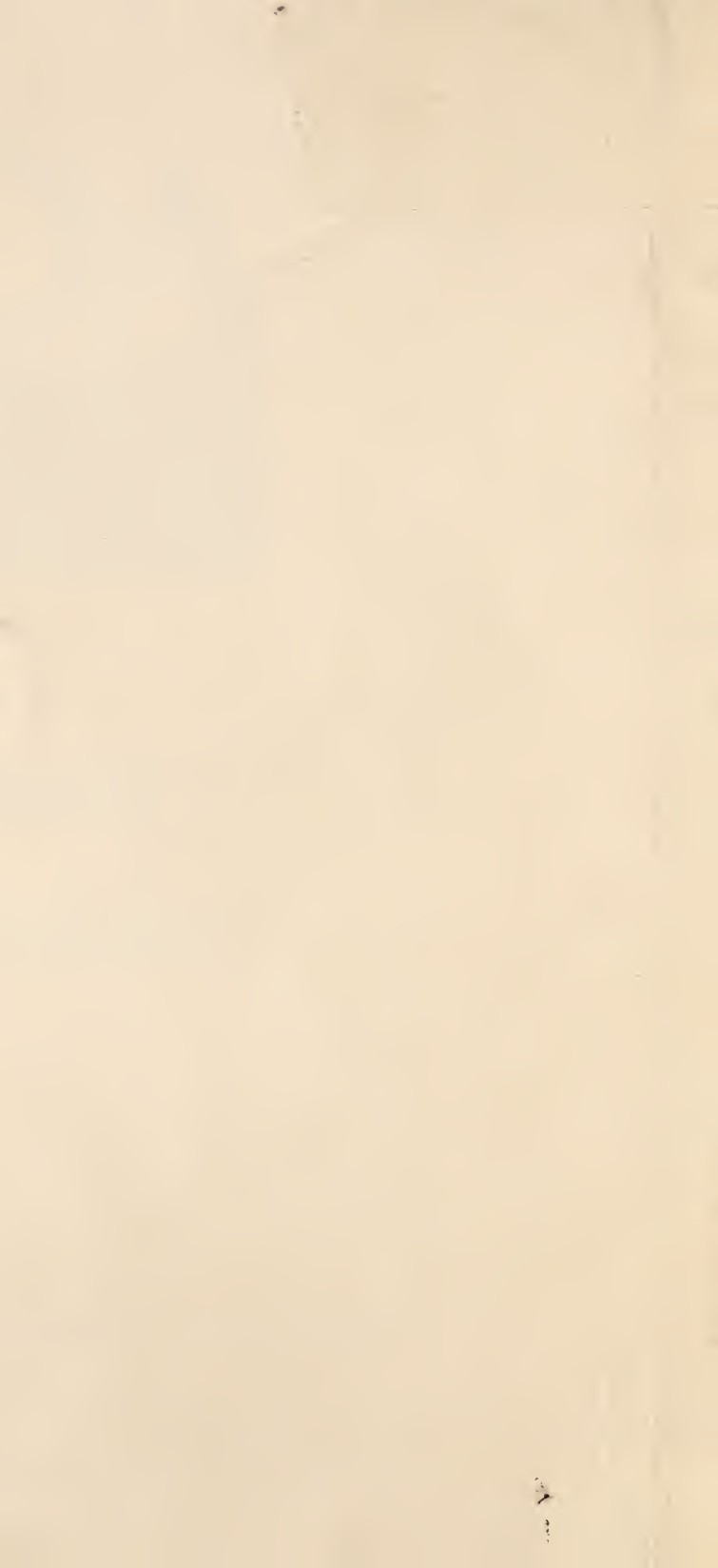


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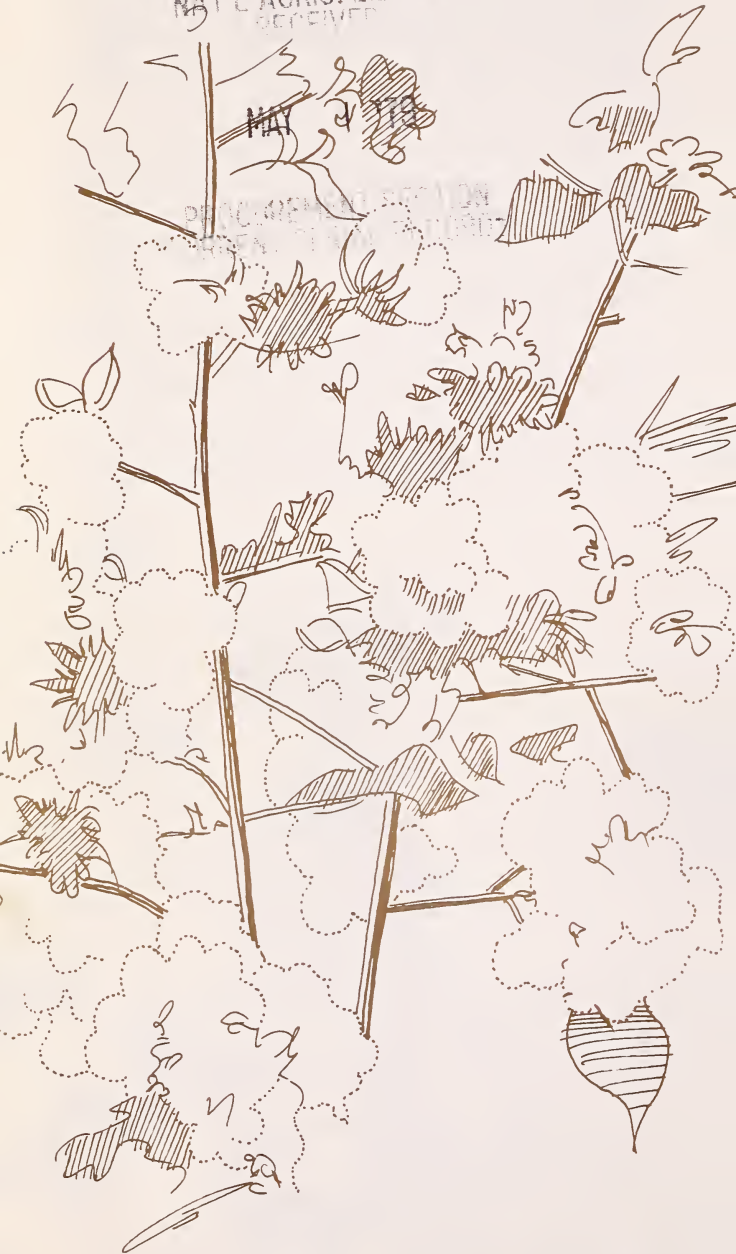
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# COTTON QUALITY WHAT IT IS-HOW IT'S MEASURED

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**Cotton:** *A Versatile Natural Fiber.* Cotton is the principal fiber produced in the United States, and the raw material used for many textile products. The uniqueness and versatility that keeps cotton in demand comes largely from its innate characteristics. The introduction of many genetic types and their production under widely differing soil and climatic conditions add to this versatility, resulting in a broad variation of quality factors.

It's important that a manufacturer know the specific quality characteristics of the cotton being bought in order to attain the desired end product in the most efficient manner. Methods of measuring these fiber properties have been well established over many years.

The U.S. Department of Agriculture (USDA) makes available a cotton classification service, and virtually all cotton growers take advantage of it. The classification gives the buyers of the cotton valuable information about whether or not the cotton can meet their specific requirements.



# Measurements of the Cotton Fiber Properties that Affect Performance

USDA cotton classification consists of quality determinations for (1) *Grade* (includes color, trash, and preparation), (2) *Staple*, and (3) *Fiber Fineness*.

## (1) Grade

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**Color.** Fiber color affects the bleaching and dyeing properties of the fabric and must be controlled to avoid streaks or unevenness in the finished product. Cotton's normally white color may change with exposure to weathering, freezing, and insect or microbial damage.

**Trash.** The amount of trash (or leaf, as it is frequently called) contained in the bale represents an obvious loss since it is removed as waste in manufacturing. Tiny particles of foreign matter which cannot be removed in manufacturing can lower the quality and appearance of finished yarn and fabric.

**Preparation.** This term describes the smoothness of the lint. Generally, normal preparation results in less waste and a more uniform product.





## **(2) Staple**

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This term represents the average length of a typical portion of fibers. Yarn strength increases with fiber length, making long staple cottons necessary for the production of fine, strong yarns.

## **(3) Fiber Fineness**

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The micronaire reading gives an indication of the fineness of individual cotton fibers. This measurement is also indicative of fiber maturity. Different cotton varieties vary in micronaire at full maturity. Very fine yarns require fine fibers for yarn strength. A fiber which is extremely fine, however, may be immature. Immaturity can cause dyeing irregularities, increase manufacturing waste in the picking and carding operations, and lower product appearance. Optimum micronaire value, therefore, is dependent upon many things, including the genetic variety of the cotton and the relative importance of strength and appearance required in any specific product.





## Use of Instruments in Classing

The classification of cotton by USDA is undergoing gradual transition from reliance upon human senses to utilization of instruments. Fiber fineness is determined entirely by instrument. Other instruments are used by USDA graders as an aid in maintaining accuracy.

Recent results from a high volume instrument system, which is in the developmental stage, indicate that the instruments provide a good measure of cotton quality and show a close relationship with processing tests. The system is designed to provide instrument measurements of fiber fineness, fiber length, length uniformity, fiber strength, color and trash.

Further information regarding USDA cotton classification may be obtained by writing:

Cotton Division/Agricultural Marketing Service  
U.S. Department of Agriculture  
Washington, D.C. 20250







February 1979

